Universities and the Supply of Graduates to the Professions

by

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The Commission on the Future Development of the Universities of Ontario

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Discussion paper prepared for the Commission on the Future Development of the Universities of Ontario

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TO: Respondents to the Discussion Paper of
The Commission on the Future Development
of the Universities of Ontario.

In February 1984, the Commission requested Professors Noah M. Meltz and David Stager of the Department of Economics in the University of Toronto to prepare a discussion paper on the theme of universities and the supply of graduates to the profession. This study has now been received by the Commission.

We believe that the analysis and review of the literature provided in this study will be useful to many respondents to the June Discussion Paper published by the Commission. It is of course understood that the views expressed by Professors Meltz and Stager are their own and do not necessarily coincide with those of the Commission.

We are making available only a limited supply of this study and would suggest that if your organization requires more than the number received you should make your own arrangements for providing additional copies.

E.C. Bovey
Chairman

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Universities and the Supply of Graduates to the Professions

1. Introduction

The Commission on the Future Development of the Universities of Ontario is directed to consider the need for a process whereby adjustments can be made regularly to the resources allocated to professional programs such as education, law, medicine, dentistry, etc., and to the level of enrolment in these programs to respond to changing labour market requirements.

This question is also to be considered along with "student accessibility to university level education", and in the context of "economic realities" and a "differentiated university structure". The wording for this part of the Commission's mandate raises a number of questions that will give this paper its general form:

1. How can it be determined that there is a need for adjustments to resources and enrolments?
2. By what process would adjustments be decided? and implemented?
3. What resources would be adjusted?
4. What is meant by labour market requirements?

In addition to the four professions specified in the Commission's mandate, it is assumed that "etc." is intended to include other professional programs such as engineering, architecture, nursing, pharmacy, forestry, commerce or business administration, agriculture, veterinary medicine, social work, library science, and music. Moreover, the specific reference to "professional programs" is taken to imply that no external adjustment process would be contemplated for arts and science programs, that is, for programs leading to a B.A. or B.Sc. degree. The question is addressed therefore to the remaining approximately 40 percent of the full-time equivalent undergraduates in Ontario universities. About 95 percent of this latter group are included in Tables 1 and 2. The cyclical changes in graduations shown in these tables - together with similar enrolment changes - are the focal point for this discussion paper. (These tables are calculated from data presented in Appendix Table A1.)

Table 1

Bachelor and First Professional Degrees Granted by
Ontario Universities, Selected Fields of Study,
1960 to 1982, Annual Percentage Changes*

Year	Education**	Business, Commerce	Law	Architecture	Engineering	Dentistry	Medicine	Total[a]
1961	25	14	-34	-26	8	-24	0	5
1962	-6	-5	-15	61	5	18	5	11
1963	15	6	-4	-35	-2	48	-3	11
1964	15	12	20	4	18	-2	-9	16
1965	16	7	6	28	-10	2	4	12
1966	-1	3	27	-6	12	2	11	10
1967	1	17	17	13	6	3	-7	18
1968	0	-1	11	38	11	2	16	17
1969	-1	1	-1	-17	14	2	7	16
1970	162	57	16	10	29	5	2	20
1971	120	-6	21	-12	6	5	3	18
1972	-16	32	7	47	3	10	8	14
1973	12	21	12	50	4	1	13	6
1974	0	7	7	98	3	14	13	7
1975	133	70	14	41	3	-10	11	15
1976	23	9	10	-32	0	9	10	7
1977	-4	11	7	52	8	-1	-3	4
1978	-13	4	-2	10	11	4	1	-1
1979	-18	-2	-2	-5	9	5	3	5
1980	-13	18	1	-24	10	9	-5	-4
1981	6	15	7	5	1	-5	5	0
1982	4	14	2	4	2	4	-4	3

* Percentage change from the previous year.

**Part of the large increase in 1970, 1971, and 1975 was due to the transfer of teachers colleges to the universities.

a This is the total for all bachelor and first professional degrees, including degrees in Arts and Science.

Source: Table A1.

Table 2

Bachelor and First Professional Degrees Granted by Ontario Universities, Percentage of Total* represented by Selected Fields of Study, 1960 to 1982

Year	Education	Business, Commerce	Law	Architecture	Engineering	Dentistry	Medicine
			(Percentage of total degrees granted)				
1960	4.8	4.2	7.8	.5	11.4	1.6	5.0
1961	5.8	4.6	4.9	.4	11.8	1.1	4.8
1962	4.9	4.1	3.8	.5	11.1	1.2	4.5
1963	5.1	3.8	3.3	.3	9.9	1.6	4.0
1964	5.1	3.7	3.4	.3	10.1	1.4	3.1
1965	5.3	3.5	3.2	.3	8.1	1.2	2.9
1966	4.7	3.2	3.7	.3	8.2	1.1	2.9
1967	4.1	3.2	3.6	.3	7.4	1.0	2.3
1968	3.5	2.8	3.4	.3	7.1	0.9	2.3
1969	3.0	2.4	3.0	.2	6.9	0.7	2.1
1970	6.5	3.1	2.9	.2	7.4	0.6	1.8
1971	12.2	2.5	2.9	.2	6.7	0.6	1.6
1972	9.0	2.9	2.8	.2	6.0	0.6	1.5
1973	9.5	3.3	2.9	.3	6.1	0.6	1.7
1974	9.0	3.3	2.9	.5	5.7	0.6	1.7
1975	18.2	4.9	2.9	.6	5.1	0.5	1.6
1976	21.0	5.0	3.0	.4	4.8	0.5	1.7
1977	19.4	5.4	3.1	.6	5.0	0.4	1.6
1978	17.1	5.7	3.1	.7	5.6	0.5	1.6
1979	14.8	5.9	3.2	.7	6.4	0.5	1.8
1980	13.4	7.2	3.4	.5	7.3	0.5	1.7
1981	14.1	8.3	3.6	.6	7.4	0.5	1.8
1982	14.3	9.1	3.6	.6	7.3	0.5	1.7

Source: Appendix Table A1.

* Total is for all bachelor and first professional degrees, including Arts and Science.

The authors were requested to provide a discussion paper that would outline the many considerations involved in governmental adjustment of enrolments, but without coming to specific conclusions or recommendations. Rather, this paper is intended as an aid to understanding and discussion of the issues raised by these considerations; it does not pretend to offer new research or analysis of the issues nor to offer comprehensive statistical data on the topics. Several references are included at the end of the paper for readers who wish to examine these questions in greater depth.

In the report that led to the Commission's appointment - the Report of the Committee on the Future Role of Universities in Ontario - it was noted that the numbers of students in professional programs other than medicine, dentistry, and veterinary medicine have been decided solely by the universities. When there is increasing concern about manpower shortages (or surpluses), the report suggests that governments may wish to intervene to offset these imbalances. Such intervention is seen to hold "many risks" because successful manpower planning has proved to be difficult. Although the report emphasizes the need for caution when governments are considering expansion in professional programs, the same caveats would seem to apply for proposals to contract the supply.

Some clarification of terms is necessary before venturing further into a discussion of the universities' role in providing trained professionals. The terms manpower policy, manpower forecasting, and manpower planning are sometimes used interchangeably, but these are not synonymous concepts. Manpower policy refers to a government's set of programs designed to improve the supply side of the labour market. Such programs usually provide for three basic activities: training and retraining; information, counselling and placement; and geographic mobility. Manpower forecasting

is a systematic analysis of the future supply of and/or demand for labour. Most forecasts deal only with either supply or demand; it is only recently that these two components are combined to estimate the net shortage or surplus of labour. Forecasts should be distinguished from projections; the latter are based on fewer variables and extrapolate the trends established in the recent past, with less effort to take account of future changes in other factors determining labour supply or demand. Manpower planning combines the results of forecasting with the programs made available under a government's manpower policy. Such planning may be exercised indirectly by offering financial incentives for persons or institutions to undertake certain kinds of training, or more directly by establishing a government training facility and requiring future employees in a certain occupation (such as nursing) to have completed this training (for example, in provincial nursing schools).

Labour market requirements is a term not easily defined. In fact, a distinction should be made between labour requirements or needs and the demand for labour. The former refers to the number of persons necessary for an optimum technical relationship or to achieve a specific economic output. There is, for example, a certain ratio of pilots to aircraft or lathe operators to machine lathes; or with a given technology a certain number in each occupation required to produce a target level of output with a specified mix of goods and services. The demand for labour is quite a different concept. It suggests that there is employment for a certain number of persons in a given occupation at a certain time, place and salary level. To forecast what this number would be at various points in the future, however, requires a set of assumptions about changes in the relative wage structure across occupations and industries, about changes in technology related to these occupations, and about changes in demand for the products of the labour.

Labour market "requirements" when referring to labour demand therefore should be seen not as a fixed number but rather as a variable quantity depending on alternative assumptions about other labour market conditions in the future.

University and faculty associations have usually been critical of a manpower planning approach to university admissions, programs, or financing because they fear the worst outcomes of this approach would dominate policy and planning. Consider for example the response of the Canadian Association of University Teachers (CAUT) to a proposal for more highly-skilled manpower:

> ...it is not at all clear that the resolution of this problem is to endow the federal Department of Employment [sic] or its provincial counterparts with authoritarian powers to redirect students as they see fit...[1]

Universities have objected to a manpower planning approach for university enrolments for a number of reasons that include the following:

1. a misunderstanding of the methods and rationale for manpower planning
2. a fear of intervention in academic autonomy
3. a desire to emphasize the consumption or personal enjoyment aspect of university education as well as its investment or manpower development role
4. a fear that curriculum would be changed as part of manpower planning
5. a concern that changes in human and physical resources would be made abruptly and would be disruptive to the longer-run development of universities.

While these reasons or concerns are understandable, there are also reasons why universities should adopt a role in manpower forecasting and planning as it relates to university education:

1. A major and perhaps the most important motive students have in attending university is to obtain formal qualifications for employment;
2. One of the main reasons for public support of universities is their provision of highly qualified persons to the labour market;
3. The universities can help improve manpower forecasting and planning by providing information and advice to the planners and to students;

4. The universities can influence planning to assure that it is not based on inappropriate precision, that some flexibility for future adjustment is maintained, and that adjustments are made in response to long run rather than cyclical variations in labour market conditions.

The balance of this discussion paper follows a sequence of questions to provide the framework for considering whether there should be direct adjustment of enrolments and resources:

- First, why should a government intervene in the operation of a labour market? What rationale is there for a public role? Are there alternative means for achieving the public objectives without direct intervention? What are the consequences in the absence of direct public involvement? Can a government intervene effectively if it is both a supplier and a user of professional labour services?
- Second, if there were to be public intervention, what labour market evidence should be used to signal the appropriate extent and time for action? That is, if government action were thought to be needed only occasionally, how would these occasions be identified?
- Third, how soon in the educational process should intervention or adjustments occur to be most effective?
- Fourth, how would the "regular adjustments to resources and enrolments" be administered? Who would decide on the total adjustment and its distribution across institutions?

After consideration of these questions, the paper returns to alternative means for achieving the adjustment objective without such direct intervention. These include indirect influences on students' educational and occupational decisions, and development of alternative sources for labour supply and alternative demands for graduates' labour.

2. Public Policy on Labour Supply

The long lead times and the substantial costs involved in providing a supply of graduates for the professions makes this subject one of particular interest for public policy. In addition, because professional occupations tend to have relatively high salaries, the general public is concerned that their children have access to universities and other institutions providing professional training or accreditation.

Figure 1 presents a diagram to outline sources of demand and supply for professional labour markets, as well as the interaction of demand and supply and the feedback effects. The diagram highlights those supply factors relating to the number of university graduates, occupational mobility or transfers, net migration, and changes in labour force participation rates and hours of work. A further factor on the supply side is the intensity of work by professionals. An examination of the intensity or efficiency with which various professionals are utilized is also important to demand-side considerations but is beyond the scope of this paper.

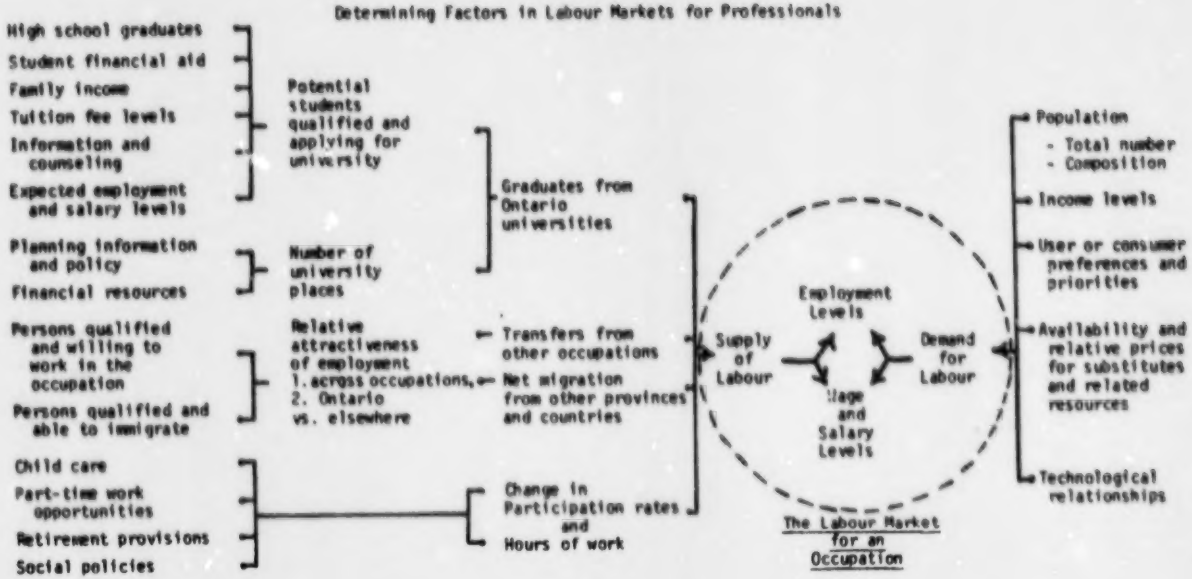
The remainder of this section deals with four topics: the rationale for public intervention; consideration of the laissez-faire or free-market option; other alternatives; and government's multiple roles in determining supply, demand, and price (salaries) for some professions.

Rationale for public intervention

There are several justifications for public intervention in the supply of labour to the professions. These can be grouped under the three basic reasons for government action in any market: 1. to encourage the allocation of resources to their most efficient uses; 2. to stabilize the behaviour of markets; 3. to influence the distribution of economic benefits across various groups.

Figure 1

Determining Factors in Labour Markets for Professionals


High school graduates
Student financial aid
Family income
Tuition fee levels
Information and counseling
Expected employment and salary levels
Potential students qualified and applying for university
Planning information and policy
Financial resources
Number of university places
Graduates from Ontario universities
Persons qualified and willing to work in the occupation
Persons qualified and able to immigrate
Relative attractiveness of employment 1. across occupations, 2. Ontario vs. elsewhere
Transfers from other occupations
Net migration from other provinces and countries
Child care
Part-time work opportunities
Retirement provisions
Social policies
Change in Participation rates and Hours of work
Supply of Labour
Employment Levels
Demand for Labour
Wage and Salary Levels
The Labour Market for an Occupation
Population
- Total number
- Composition
Income levels
User or consumer preferences and priorities
Availability and relative prices for substitutes and related resources
Technological relationships

The most efficient use of resources in higher education would seem to favour a few, large faculties offering professional programs rather than several small ones. The high fixed costs for medical schools, for example, have resulted in there being only five rather than fifteen medical schools in the province. Governments are necessarily involved in educational planning at such levels and magnitudes. This should of course result in lower costs both for professional training, and in turn, for the services provided by the graduates. Further public action may be necessary however to assure that artificial restrictions - such as fixed fee schedules - do not result in unduly high incomes for the recipients of lower cost training. One measure of the balance between costs of training and professional incomes is the rate of return on the student's investment in education. This measure can be used together with other data to assess appropriate public policy toward supply considerations. When, for example, the private rate of return remains high over a long period, that labour market should be examined closely to discover why competitive forces are not able to bring the rate closer to the average for other occupations.

Another factor affecting optimal resource allocation from a social perspective concerns what economists term "externalities". These are the effects on third-parties that are not taken into account in the usual private market transaction. It is often argued, for example, that society enjoys many external benefits associated with highly educated persons; these might include community leadership, more rapid acceptance of social and technological innovations, and so on. It is largely on this basis that public subsidy in the form of low-cost tuition has been provided for university students. One needs to question, however, whether at current enrolment levels the additional social cost is matched by the additional external benefits. This comparison could indicate that enrolments should be adjusted, although not necessarily by direct control of admissions.

An essential feature of ideal labour market conditions is good information for both suppliers and users of labour services. This information, such as knowledge of occupational pay and conditions, and about the quality of service can be costly in terms of both time and money for individuals to obtain. Government departments can collect and distribute this information more efficiently; consequently, governments have a major responsibility to provide information that will enable markets to function more effectively. Governments may delegate the "quality control" function to some self-governing professions, but usually some ultimate responsibility is reserved in the legislation providing for this function.

Public intervention may also be required to reduce the cyclical fluctuations in wages or salaries and unemployment due to lags in the market adjustments. This is where detailed market forecasts can be useful. Students planning to enter certain occupations can be made aware of expected market conditions and thereby possibly alter their educational and career intentions. Since inaccurate or misinterpreted forecasts can worsen cyclical fluctuations, major resources are required to develop and use appropriate forecasts.

Finally, governments may take action to assure more equitable access to membership in the professions and/or to make professional services more easily available to all groups in society. These distributional problems are often not dealt with effectively by market forces and consequently require government intervention. Conversely, it may be argued that governments should not intervene if the result is to restrict the educational choices available to students who are qualified for and interested in certain professional careers.

There are of course other, non-economic reasons for government action - namely, the pressures from interest groups that can be rationalized only within a political framework.

The laissez-faire or free-market option

There are two closely related arguments for a laissez-faire policy on the supply of graduates. One argument is that the market will determine the appropriate number to be trained. If there is an excess demand for the profession then salaries or fees will rise, more persons will be attracted into the profession - through new training, transferring from other occupations, re-entering the labour force, or by immigration. This increase in supply will continue until additional benefits from practising the profession are just equal to the additional costs. The reverse would occur in the case of excess supply. In the long run the market forces will produce an optimal distribution of resources.

A related argument for laissez-faire is that while the market does not operate quite as smoothly as suggested above, intervention by public authorities may disrupt market forces and make things worse than they otherwise would have been. The intervention could magnify the excess demand or excess supply if the timing or the magnitude of the intervention is inappropriate. In the past, there could be no assurance that public authorities were better able to forecast future developments than the collection of individuals that constitute the market; the end result for public intervention could likely be worse in economic and social terms than if there had been no intervention.

While there is compelling force for much of the laissez-faire argument when applied to markets in general, there are some features in the markets for professionals which mitigate a pure laissez-faire approach. The first is the high cost of training, especially in such professions as medicine, dentistry, and certain branches of engineering. While some persons could obtain funds to cover the full costs of such training (by having wealthy parents, by borrowing, or perhaps by judicious saving), society has deemed it preferable to subsidize the cost of training in recognition of external benefits and the desire to increase access to the professions.

A second difficulty in the pure laissez-faire approach is the time involved both for the training itself and for developing facilities for the training. Professional programs at the postsecondary level can require 7 to 12 years while it takes even longer to develop facilities to provide the training. The rapid expansion in postsecondary education in Canada from the mid-1960s to the mid-1970s required a concomitant expansion in the teaching staff. The fact that there was not a prior expansion in the numbers of trained university teachers meant that the Canadian university system had to import foreign-trained teachers to teach Canadian students. There then arose a political concern about the number of foreign-trained and foreign-born teachers.[2] This was a reaction against a symptom rather than the real cause of the situation which was an absence of prior planning and preparation of teachers.

A third point is that there may be greater difficulty in guaranteeing quality of professional service under a laissez-faire approach than under public intervention, even if that intervention involves delegating the responsibility of policing quality to a self-governing profession.

These three considerations - the high cost (especially for buildings and equipment) and the long lead time to establish training facilities, together with a concern for quality of training and service - suggest that one should separate the long-run and the short-term reasons for government intervention. A distinction should be made between the need for governments to work with university authorities to develop long-run plans for the size, locations, and function of professional schools and the short-run planning by internal university groups to accommodate cyclical shifts in enrolment patterns.

This distinction can be illustrated by reference to two studies on law school enrolments in the United States.[3] One study found there were very long swings or cycles in enrolments due to a preponderance of private, profit-seeking law schools in the early decades of this century. Then enrolment

dropped as governments intervened to regulate the quality of the schools, and then later expanded as the publicly-chartered schools were gradually enlarged. Within these broad long-run fluctuations, however, there were short-cycle changes in enrolments as students responded to changes in the expected rates of return on investment in legal training.

It is quite likely this distinction between cyclical and secular changes led the Fisher Committee to recommend that major investment in increased capacity "should be contemplated only when the indications of demand are unmistakable and likely to be enduring". (p. 14)

Alternatives to Laissez-faire

The alternatives to laissez-faire are those that would affect the various factors influencing the sources of supply shown in Figure 1. Current public policy on labour supply focuses on domestic education and on immigration. Most professional labour markets draw supply from both sources. Law is a notable exception since the large majority of practitioners are trained in their province of practice.

Figure 1 indicates the considerations that affect individuals' decisions on professional training and on migration to or from Canada. Public policy affects the supply of persons through the availability of subsidies, loans, low tuition, and residence expenses; net cost of training; availability and location of places in the training system; type of counselling and other information available; number of persons admitted as immigrants; tax legislation on net income derived from the number of hours worked and the intensity of work, especially by comparison with taxes on professional incomes in other countries. Public policy influences the demand side to the extent that it sets a profession's fee structure and the extent to which the public assists in collecting the fee or subsidizes the fees, services and the income of the professionals. In addition, the public sector may be a major purchaser of the services of professionals.

Alternative approaches to affecting the supply or demand for professionals can be seen by reference again to Figure 1. To the extent that it is possible to substitute other occupations, paraprofessionals or other services for those of the highly-trained professional, the government could influence the use of such alternates. For example, if the government increases the supply of paraprofessionals such as engineering technicians, this could lower their relative wage and encourage employers to substitute them for engineers. Alternatively, government regulations restricting the use of paraprofessionals, such as denturists, tend to increase the demand for the professionals, in this case dentists.

Supply can also be affected by alternative opportunities open to graduates. Not all graduates go to or remain in the professional field for which they were trained. As Table 3 shows, relationships between field of study and occupation vary widely. The attrition of professionals may be part of a natural progression in the management development hierarchy (for example, engineers who become managers) or the lack of opportunity within a given profession compared with more attractive alternatives. Whatever the reason, it is important to consider the likely retention rate in the field before planning enrolment changes. If demand increases in an occupation it may be preferable on economic and social grounds not to expand supply but simply to allow the occupational retention rate to increase through higher salaries, more specialized use of the professionals, and perhaps better working conditions, etc.

Government's Multiple Roles in Certain Labour Markets

In some professional labour markets, governments exercise multiple roles in determining simultaneously the supply, demand and fee or salary schedule. It is useful to identify these roles as part of the overall effect on the supply of graduates from the university programs. Medicine and education present two of the most significant cases in which government operates on both sides of the market, as well as having a major effect on salaries or earnings.

Table 3

Principal Occupations for Bachelor and First Professional Degree Graduates, Two Years After Graduation, by Field of Study, Canada, 1971 and 1978

Field of Study	Most Common Occupations	Percentage of Graduates in that Occupation	
		1971	1978
Dentistry	Dentists	94	96
Medicine	Physicians	82	86
Pharmacy	Pharmacists	80	91
Nursing	Nurses, therapists	50	81
Law	Lawyers and related	94	89
Teacher training, education	Teaching	81	79
Engineering	Engineers	59	57
Commerce, business	Management support and management	60	55

Sources: W.G. Picot, University Graduates and Jobs: Changes during the 1970s; and W. Clark and Z. Zsigmond, Job Market Reality for Postsecondary Graduates.

In both professions, the government has formulated detailed plans for the training of new entrants in terms of the location, size, and quality of program. The demand for these graduates is determined largely by public policies on the provision of health services and schooling. Normally, the interaction of supply and demand - even when influenced by government on both sides - would lead to an equilibrium salary or fee schedule. But in the case of medicine, the government negotiates a fee schedule for medical services, while teachers' salaries are conditioned by public budgets through government grants and municipal taxation. In such cases, the normal market system barely exists. Alternative strategies for dealing with these circumstances are available; for example, it may be preferable for government to decide on the quantity and quality of schooling that will be provided and then announce the implications of its plans for employment of graduates of the teacher-training programs.

For medicine, the appropriate strategy is less obvious. Some would argue that medical education should be made available to all qualified Ontario students, even though they may not find employment in Ontario at an acceptable income level, because they then can migrate to other jurisdictions for a lifetime practice. This is one of the logical outcomes of a bona fide equality of opportunity approach to university education. A conclusion such as this also presses one to re-examine the appropriate extent of government involvement in a labour market where it has a major impact on all three of the basic dimensions - supply, demand and price.

3. Direct Adjustment of Labour Supply

Labour Market Signals

What signals from the labour market might result in public pressure or otherwise cause the government to intervene? Evidence offered by the public or by special interest groups in seeking government intervention has included, in the case of excess supply:

1. An increase in the unemployment rate for a particular occupation - or more correctly- among individuals who are trained for a particular profession or who are attempting to enter that profession. These unemployment rates usually are higher than the published unemployment rates for occupations which refer to the occupation in which a person was last employed.
2. A decrease in the number of unfilled vacancies. (The statistics are no no longer obtained on a systemic basis since Statistics Canada's job vacancy survey was discontinued in 1978.)
3. A decline in the relative earnings for an occupation. Persons in that occupation may notice their earnings are not keeping up to the earnings in occupations with which comparisons are usually made.
4. An increase in the ratio of the occupation to the total population, or an increase in the occupation's relative size in the total labour force.
5. An increase in the rate of output of graduates from a program.
6. A decline in the rate of return on investment in training for a specific occupation.
7. An apparent decline in the quality of service provided as practitioners take on more work to maintain a desired income level.

Changes in the opposite direction could of course, be seen as signals of excess demand or shortage. In each of these cases, however, the market may simply be adjusting to changes in the supply and demand conditions. It is this very adjustment process which leads the market to a new equilibrium level where supply and demand are in balance - although possibly at a different relative wage or salary level than before.

In most cases it would be inappropriate for government to intervene in this adjustment process; there is too great a risk that the reaction would be too strong and the original problem would be exacerbated. Where the market seems to have a very delayed response, however, some action may be necessary. For example, a sudden sharp increase in the demand for a particular profession may send those fees or salaries to unacceptably high levels because supply response is delayed, if only due to the training time for new graduates. In this case it may be decided to allow paraprofessionals to do more of the work usually reserved for professionals, but this could be done successfully only if there were a clear understanding that the profession would revert to its original practices with the arrival of new graduates for the profession. A situation like this occurred in the 1950s when the "baby boom" increased the demand for elementary teachers. Teaching certificates were temporarily made available to lesser-trained persons until properly-trained teachers could be graduated.

A more formal signal of a labour market imbalance is derived from forecasting models that show an excess supply of or demand for labour in a given occupation. These models are useful only if the results can be presented for several points in time - so that a trend can be seen - and for alternative assumptions about variables affecting the labour market. Such forecasts must be continually updated as underlying conditions change.

Until recently, there was no single source for high-quality, regular information and forecasts for specific occupations that included both sides of the labour market. In 1981, the Ontario Manpower Commission completed its model for forecasting simultaneously the demand for and supply of persons in specific occupations. This is designed to provide a comprehensive set of forecasts of net shortages or surpluses for most occupational groups. Soon after that, the federal and provincial governments reached agreement to co-operate in developing the Canadian Occupational Projection System (COPS).

These forecasting models - and especially their antecedents - have been criticized for being too precise in an area where rough estimates have more credibility. In fact, the models must deal with specific numbers for both their input and output. It is the users of the results who must determine the appropriate level of precision with which the results are interpreted and used for planning.

These forecasting models do at least have a major advantage over other approaches to manpower planning in that they attempt to include effects on demand of changes in a number of economic variables such as personal income and relative prices. Manpower analyses that are based on other methodologies such as the "population density" ratios are especially inadequate. Medical manpower studies, for example, have tended to emphasize the basic population ratio and the resulting number of "physician visits", but have not considered how economic changes would affect the demand for different kinds and qualities of medical service. This point is emphasized by Ahamad and Blaug:

> Observed ratios are the results of demand and supply forces and, because of differences in the socio-economic characteristics of the population at different points in time, they may imply sup-optimal or even undesirable standards of medical care.[4]

How Much Lead Time?

Suppose a government did decide to alter the number of graduates from a program. What would be the optimal stage in the educational process for an adjustment to be made? How much lead time is required, in the case of enrolment reduction, on the assumption that the government wishes to avoid the political distress caused by denying places to students who expected they would be admitted to a program under existing rules and conditions? For most of the professions - and particularly those with the longest training periods - a decision to enter that occupation is made early in a student's schooling.

An attempt to change the flow of persons into a given occupation requires information about decisions taken by students at each stage along the route from an offer of admission to the program until one enters the given occupation. This means that the transition ratios (or percentage continuing from one stage to the next) would need to be forecast accurately.

The lead time for large, secular or permanent adjustments is actually much longer than the time from a student's career decision to occupational entry because the human and physical resources - and especially the teaching staff - cannot be changed quickly. A case in point concerns the supply of university teachers for the 1990s and beyond. An analysis of the current stock of university professors in Ontario shows an aging workforce. Without appropriate current planning to replace the retiring staff over the next two decades, the result could be a repetition of the situation in the 1960s when

foreign-trained staff were recruited to fill vacant teaching positions. The planning required for this type of situation is long-term, based on many uncertainties, and requires inter-governmental cooperation. Furthermore, the adjustments should err on the side of too many rather than too few graduates. A shortage of professionals can be costly for an economy in terms of inadequate service, higher fees, and restricted employment for related occupations. As other authors have noted

> The cost to the economy of an inadequate supply of educated persons is probably greater than the expenditures of resources involved in creation of an excess of graduates beyond the needs of the economy, and in this sense an over-expanded educational system is less costly than an underdeveloped one.[5]

Implementing the Adjustments

Suppose further that specific adjustments were to be made for enrolments in a given professional program. This would require a decision on the change in total enrolment, and on the distribution of this change among the universities offering the program.

If an expansion of enrolment is thought warranted, how is the increase to occur? At which institutions? and how many more places are to be provided at each institution? Should the expansion be accomplished simply by lowering the admission standards (on the assumption that applicants are ranked by academic qualifications and are admitted in this rank order) or should there be a promotional campaign to attract academically-stronger applicants who might have been destined for other programs? Suppose, for example, that a substantial number of students are at the crossroads between deciding on an MBA or an LLB program. Should it be desirable to increase MBA enrolments one could dip further into the pool of applicants, or alternatively try to attract some of the better LLB applicants into the MBA programs. For the latter approach to be successful, data are needed on students' perceptions of the substitutability of career options.

An American labour economist examined the process of students' career choice and found that

> There is substantial diversity in the alternatives of [i.e. for] students in most fields. One third of the potential engineering work force, for example, expressed a serious interest in non-scientific fields. Twenty per cent of the medical and pre-medical students considered law or business as their closest alternative...In short, the characteristics and ability requirements of occupations do not constrain the possibilities of students to a narrow group of related fields.[6]

Possibly the most difficult decision in this process is to determine when the enrolment "adjustment" can cease. The process in question differs fundamentally from most other educational planning decisions in that it is intended to deal with cyclical changes in enrolments. Previous government planning in post-secondary education has dealt only with secular or permanent changes: how many medical schools would Ontario need, and how many medical students should be accommodated? The current question, however, implies that enrolments might be changed periodically such that a decision to increase enrolments might later be followed by a decision to reduce enrolments.

A short-run expansionary adjustment also raises serious questions about how the instructional resources would be provided. The three basic options are to recruit staff on short-term appointments (or "contractually limited term appointments" as they are currently known in Ontario); to rely on more part-time appointments of persons who are practising the profession concerned outside the universities; or to hold staff constant and allow the student: staff ratio to increase. In each case, there are significant disadvantages in terms of the students' educational experience and the administration of the programs.

In summary, any direct attempt to adjust cyclical enrolment patterns must meet several criteria to be successful. Such adjustments must be based on accurate information and competent judgments; occur early in the cycle so that an independent cyclical correction is not unduly amplified; be understated and reversible; and should not affect the instructional quality of the program.

4. Alternative Approaches to Influencing Labour Supply

Few labour economists would advocate direct intervention to adjust labour supply in the short run if the market mechanism would function more satisfactorily. This requires that the market should respond more quickly to shifts in supply and/or demand and the resulting changes in relative wages or salaries. Some of the means available for improving professional labour markets are discussed in the following sections.

Better forecasts, information, counselling

One of the basic reasons for government intervention is to reduce the fluctuations between excess demand for professional labour and its excess supply. Although there is still much controversy over the role of manpower forecasts, information and analysis on the behaviour of specific labour markets along with manpower forecasts can assist in reducing the swings that tend to be experienced between shortages and surpluses.

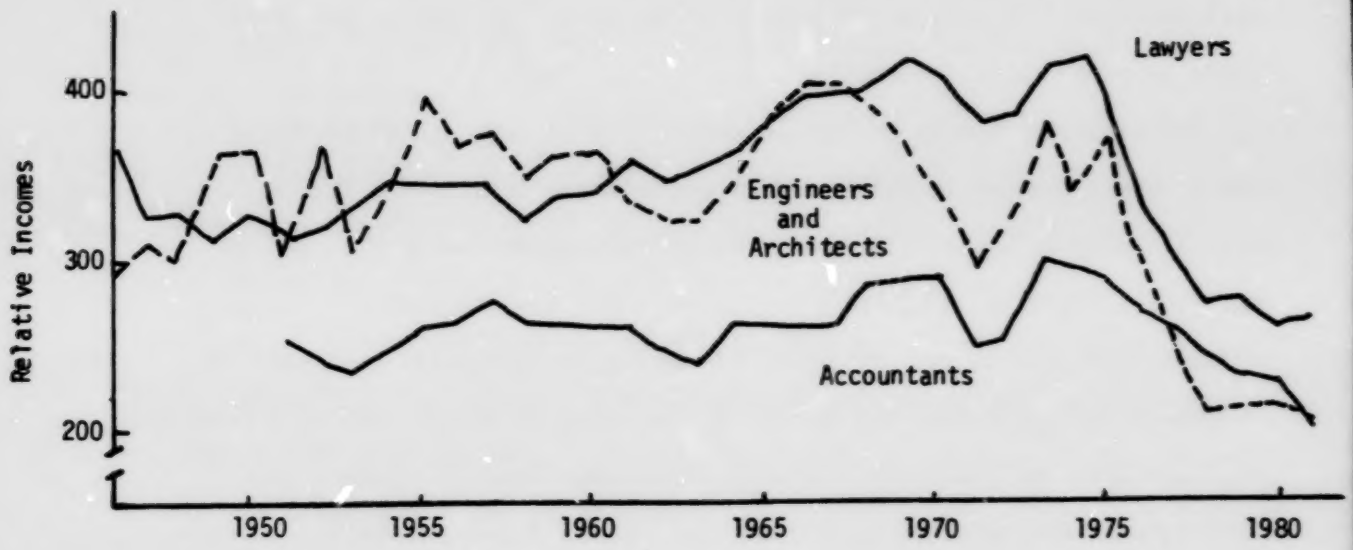
Various reports on labour market conditions for university graduates have emphasized the need for better information on which students can base their career choices. A Canadian task force reported that there is "an urgent need for the development of better labour market intelligence on prospective demand for and supply of workers"; in the United States the Carnegie Commission

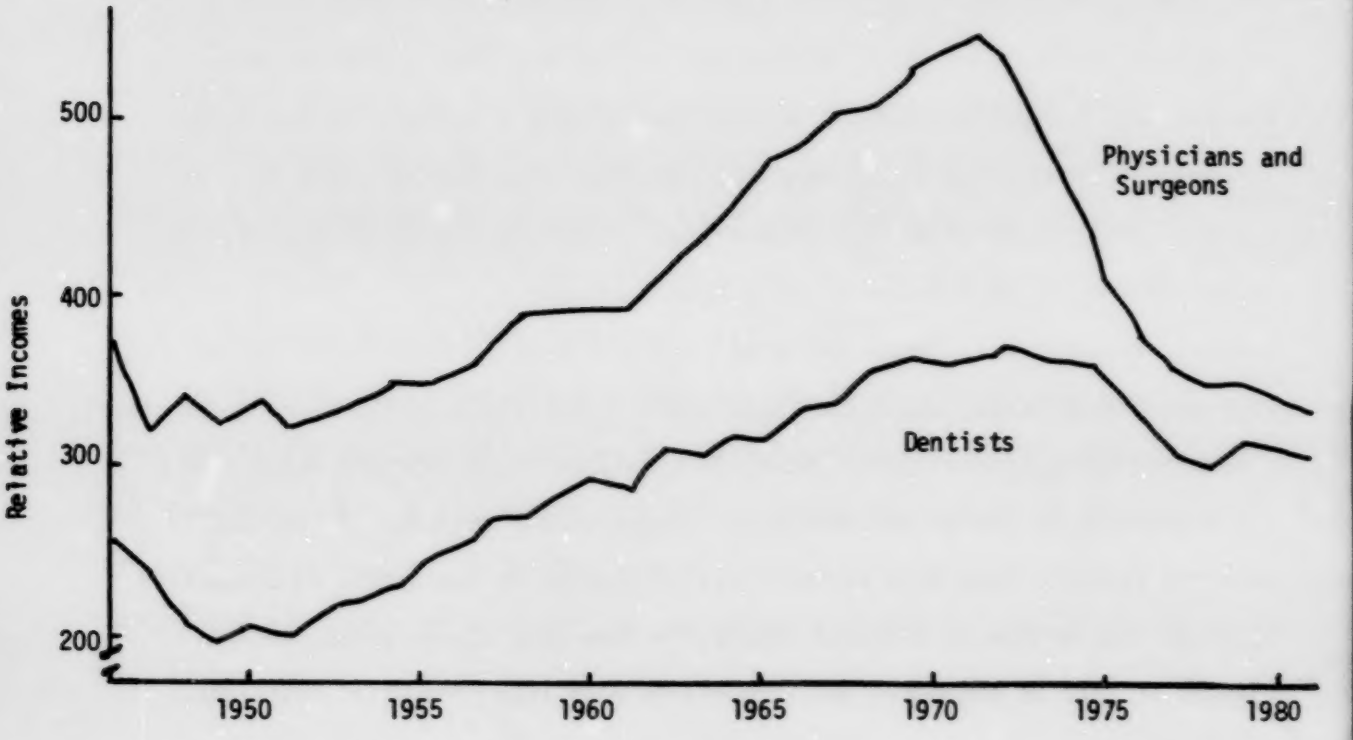
saw that reliance on student choices for making occupational adjustments implied a "need to provide students with the best possible information"; while in Great Britain a research seminar on higher education recently concluded that "the scarcest commodity in the market for highly qualified people appeared to be information".[7]

The highest priority is for the most difficult information to obtain - namely recent changes in the structure and behavior of specific labour markets. With an emphasis on this kind of information, one would hope to encourage continuing, marginal adjustments rather than substantial, erratic shifts in career choices. Detailed information is especially important for students in programs that can lead to a wide range of occupations. Consideration of alternative employment will include close comparisons of changes in starting salaries, working conditions, and potential development.

Some professional occupations experience more cyclical market behavior - in terms of relative earnings and availability of new jobs - than do other occupations. Potential entrants should know whether a specific market is at its peak or trough, but it is even more important that they be aware of these cycles. The "cobweb effect" of high prices followed by increased supply and falling prices is well-known in agricultural markets, but this effect is not so commonly recognized in labour markets. Figure 2 shows that relative incomes for engineers, architects, and accountants appear to follow a fairly short cycle closely resembling the business cycle. Students should be fully informed about such cobweb effects in labour markets, where lagged supply responses to changes in relative salaries result in strong cyclical changes in employment opportunities. Students should also be aware of changes in long-term career paths, such as changes in jobs as engineers and accountants move into managerial positions.

Figure 2
Relative Incomes* of Self-employed Professionals,
Canada, 1946-1981





*Average total income of professional group as a percentage of average income for all taxpayers

Source: Taxations Statistics, Revenue Canada, annual, Table 3A.

This requires that labour market entrants have an understanding of alternative career routes or paths. In the same sense, students need to understand the "internal labour market" concept and be able to distinguish "ports of entry" for different employers or professions. Students should also be aware of the opportunities and procedures for changing occupations, the costs and benefits for doing so at various stages in their careers, and the changing role and impact of paraprofessionals in the traditional "protected" occupations such as law and medicine.

Will students respond to labour market information? There is evidence that students do have some of the detailed labour market information just described and that they do respond by making occupational changes. The Carnegie Commission answered the question of student responsiveness quite directly:

> the evidence seems to reveal a considerable degree of student responsiveness to changes in relative job opportunities, but within a framework of rather substantial stability in overall patterns of student tastes and abilities...In addition to shifting among fields, students also shift among specialties within fields, often in response to job market changes. [8]

Richard Freeman's survey, to which reference was made previously, found that:

> For many students, career plans are amenable to change during college in response to new information or conditions... The time at which a student makes his career decision and his amenability to change varies according to intended area of specialization...Students in medical and scientific specialties, for example, tend to choose their careers before college... As a consequence, the scientific and medical markets can be expected to operate differently from those for non-scientists. Adjustments in supply will be slower, and more time will be required to attain equilibrium.[9]

Freeman also reported that most students were reasonably satisfied with the occupational information available to them at the time of their most recent career decision.

Although the majority of students indicated that they had sufficient information for their career decisions, it is possible that their information was incorrect. A 1969 survey of Queen's University (Ontario) students found that "...over one quarter of the male students appear to have a very poor knowledge of [starting] salaries." One result of this misinformation is that:

> More male students enroll and remain in engineering compared with arts or commerce than would do so were information accurate. Hence imperfect information leads to a greater supply of engineering graduates (as of 1969) than would be the case if information were accurate...There appears to be some tendency for males to overenroll in commerce vis-a-vis social sciences because of poor information.[10]

Freeman concluded from his survey that students have accurate information about the characteristics of the five well-known professions (engineer, lawyer, doctor, professor, business) but his evaluations were based on rankings rather than absolute values. He did, however, reveal an important factor in the formation of expectations which leads to resource misallocation, namely that students are excessively optimistic about their own income prospects: "On the average, students expect other [college-trained] workers to earn less than they themselves" but they did have a fairly accurate knowledge of the average income for their chosen occupation.

The most significant finding related to the notion of marginal adjustments in the labour market was that there exists a large group of students who "appear willing to alter their plans when market conditions change". A summary of these several issues could not be phrased more succinctly than the position presented recently at a seminar on higher education and the labour market:

> The slowness of the adjustment, of the flow of information to prospective students, and of the response of colleges provides a basis for policy intervention, notably manpower planning... What we are arguing is that the present state of affairs may correspond to an attempt on the part of students to make rational choices in difficult circumstances, and an attempt on the part

> of higher education institutions to respond to them. To the extent, however, that the choices and the response could be improved there is a role for manpower planning at least in the minimal sense of the provision of information...It should be added that insofar as such information is already collected, it needs to be widely disseminated in a form which is reasonably comprehensible. Moreover, given our emphasis on rates of change of the stock and flow of graduates and their employment conditions, it is not a matter of the once-for-all acquisition of some facts, but of a continuous process of regular data collection.[11]

One may ask what it would cost to collect, analyze, and distribute such labour market information, and whether it is worth it. The cost of not following this course is the cost of increasing unemployment, underemployment, job dissatisfaction, reduced output, and skill shortages - or in other words, inefficient use of human resources and social discontent.

Career information and counselling serves to link the two basic approaches to educational planning - the manpower planning approach and the "social demand" approach. These have been regarded as conflicting or alternative bases for educational planning in that the first attempts to meet the economy's manpower demands while the latter is intended to meet individual student demands for further education. Since vocational preparation is a paramount factor in the educational decisions for most students, accurate information on expected labour market conditions should lead to similar results under both approaches.

International and interprovincial migration

The advantage of relying on immigration to reduce labour market fluctuations is that the reaction time is much less. In addition immigration represents lower costs since these have been borne by other countries: Canada receives human capital that someone else has financed. The proportion of the total

occupational labour force provided by immigrants varies by occupation. (Lawyers are the least likely to be imported due to the country-specific nature of the legal training.) Although there have been sizeable outflows of professionals from Canada, on balance in the post-war period Canada has experienced a brain gain. As Table 4 indicates, there has been a general trend to less reliance recently on immigration for professional manpower. This is partly due to the relative decline in the attractiveness of Canada compared with Western Europe and partly because of the increase in employment in Canada and the concern to develop Canadian human resources. Even so, immigration of physicians and surgeons accounted for four-fifths of the net increase in the number of medical doctors in Canada between 1971 and 1981, while almost two-fifths of the increase in university professors and engineers came from abroad.

Interprovincial migration has varied by province and occupation. Ontario has been a net receiver - except for the late 1970s when Alberta was attracting Ontarians. Net interprovincial migrants have been less important for professional labour supply than immigrants and Ontario graduates. Table 5 presents some evidence on the destination of graduates of Ontario universities, but caution has to be exercised because some graduates may be returning to their home provinces rather than migrating. This is particularly true for high cost, low enrolment programs that cannot be economically provided in each province. Furthermore, landed immigrants and visa students from other countries may be graduated in Ontario but decide to settle elsewhere.

Use of paraprofessionals and other resources

The objective of policy on the use of paraprofessionals and other resources should be to reduce total costs for the user and/or improve the quality and range of services. The danger is that some occupations could feel threatened and attempt to hamper an increase in the use of certain paraprofessional

Table 4

Recent Immigrants[a] as a Percentage of the 1971 and 1981 Labour Force and of Labour Force Change, Canada

Occupation Group	Inter-decade Immigrants in Occupation as Percentage of Labour Force in Occupation at end of decade		Inter-decade immigrants as percentage of inter-decade Labour Force Change	
	1961-71	1971-81	1961-71	1971-81
Dentists	6	5	41	14
Physicians and surgeons	19	24	75	81
Graduate nurses	10	5	23	12
Lawyers	1	1	5	3
University teachers	32	11	60	37
Elementary and secondary school teachers	6	2	17	12
Engineers				
Civil	14	11	32	32
Chemical	19	14	140	38
Electrical	17	13	42	30
Mechanical	18	15	49	47

a Immigrants during 1961-71 as a percentage of the 1971 labour force, and during 1971-81 as a percentage of the 1981 labour force.

Source: Helen Buckley and Soren T. Nelsen, Immigration and the Canadian Labour Market, Ottawa: Manpower and Immigration, 1976, p. 25; 1971 Census of Canada, Vol. III, 94-734, Table 4; Noah M. Meltz, Manpower in Canada 1931 to 1961 Historical Statistics of the Canadian Labour Force, Manpower and Immigration Canada (Ottawa: Queen's Printer, 1969), Table B1; 1981 Census of Canada.

Table 5

Location of Ontario University Graduates 1979, by Field of Study

(percentage distribution)

	Education	Social Sciences	Commerce	Engineering	Health	Total[a]
Maritimes	1.2	0.9	0.9	0.9	4.5	1.4
Quebec	2.2	2.2	2.7	4.1	2.8	2.7
Ontario	88.7	86.8	87.3	79.9	79.9	84.5
Prairie Provinces	4.9	5.0	4.4	10.6	5.2	5.6
B.C., Yukon, N.W.T.	1.7	1.7	1.5	3.2	4.9	2.3
TOTAL CANADA	98.8	96.5	96.9	94.0	97.2	96.5
U.S.A.	0.4	1.3	0.7	1.9	2.1	1.4
South & Central America	0.4	0.5	0.2	0.5	0.0	0.4
Europe	0.1	0.5	0.2	0.4	0.4	0.5
Africa	0.1	0.8	1.7	2.3	0.1	0.9
Asia & Oceania	0.2	0.3	0.3	1.0	0.2	0.4
TOTAL NON-CANADA	1.2	3.5	3.1	6.0	2.8	3.5

Percentage figures may not add to 100, due to rounding.

a Total is for all graduates, including fields of study not shown.

Source: Ontario Ministry of Colleges and Universities, Employment Survey of 1979 Graduates of Ontario Universities.

occupations. Consequently, the best time for expansion in the use of paraprofessionals is when demand and professional fees are increasing.

The demand for professional services can be satisfied in a number of ways, that is, various combinations of senior professionals, paraprofessionals and assistants, and physical equipment and resources can be used in most professions to achieve any given result. This has become especially apparent in medicine and dentistry where a variety of support personnel now perform services previously supplied by a physician or dentist. Under a given set of technological and economic conditions, there will be an optimal way to provide a certain professional service, but there is not necessarily only one way. This economic and technological flexibility can be altered by public policy on the use of paraprofessionals and other resources, and consequently the supply of professional services can be altered by public policy without relying on a change in the number of professionals available. This condition is highlighted by the specific example described in the boxed quotation on the following page.

Alternative occupations for graduates

In Table 3, one can see the extent to which graduates are working in occupations for which they were trained. The relationship between occupations and particular fields of training varies considerably. In planning for future developments in professional education, two considerations should be kept in mind: first, the past linkage between education and occupations; and second, possible future patterns in the relationship between education and work.

The debate between those economic planners who advocate manpower forecasting for educational planning and those who sympathise with the aims but doubt its practicability can perhaps best be summarized by means of an example. Let us suppose a decision is taken to build a new general hospital in a particular urban area. Statistical records can show the probable mix of patients who will seek treatment at the hospital. It is possible, therefore, to specify how many surgeons, how many physicians, how many obstetricians, how many ward sisters, how many staff nurses, how many nursing auxiliaries, how many secretaries, how many porters and so on will be required to staff this hospital. If this is done for the whole of the health services, it shows the total national need for medically qualified people over a particular planning period. If it is done for the whole economy, it gives the total need for all kinds of qualified people.

Opponents claim that such an analysis treats the economy as a machine and not as an economic system. There are many different ways of staffing a hospital and even more of staffing a health service. If there is a bottleneck in the supply of doctors, or if the price of their services is high, many of their tasks can be performed by nurses. If secretaries are expensive, doctors and nurses find themselves doing more of their own paper work, thus having less time for their medical work which means, in turn, that more of them will apparently be "needed". Over the health services as a whole, the possibility of substitution between hospital, general practitioner and local authority welfare services is considerable. Whether a mother with a young baby is advised by a consultant paediatrician, a general practitioner or a health visitor, is in part an economic decision. It is not inevitable that an anticipated "X" thousand births will "require" so many paediatricians, so many district nurses and so on. If this is the case for the health service, it is even more true for the economy as a whole where the possibilities of substitution between different kinds of manpower are much greater.

Source: Fulton et al. p. 26 as adapted from Peter Armitage and Gareth Williams, Planning Models in Education, Open University Press, 1976.

The past linkages may not be appropriate for future planning if new occupations become available and economically desirable for graduates of a given field of study. A good example concerns law graduates. The expectation in Canada has been that law school graduates would practise law, but in the United States law graduates have been employed in a much wider range of occupations. The question for Ontario is whether supply should be restricted to maintain the past pattern and relative incomes or whether law graduates should be encouraged to seek other occupations. Through normal adjustment, the market for law graduates is coming into balance as the number of graduates and persons called to the bar in Ontario declines. While this supports a laissez-faire approach, it also suggests that governments should not overcompensate by further reducing the number of students enrolled in law schools.

Differential tuition fees and student aid

Tuition fees and student aid are also factors affecting enrolment in universities. From the perspective of the supply of graduates the question is whether lower (higher) differential fees should be charged to either attract (or discourage) students in fields of prospective shortage (or surplus).

The differential fee question can be argued in two ways. A lower fee for occupations likely to be in short supply could be seen as necessary to attract students. On the other hand it could be argued that if the shortages materialize their wages will rise and the graduates will then have received

an additional subsidy in their education plus greater economic rent when they reach the labour market.

The other difficulty with differential fees based on current market demand or supply is that the market could change and with it differential earnings. Graduates may believe that the fee differential represents an implicit guarantee of future relative rates of return. Differential fees based on the relative costs of education would not suffer from this difficulty.

5. The Lawyers' Labour Market: A Case Study[12]

Many lawyers have argued that there currently is a "surplus" of lawyers and that there should be quotas on law school enrolments.[13] Is there a case for more specific controls? Or is this a delayed market adjsutment to a "shortage" in earlier years?

Recent changes in the supply of lawyers have been determined strongly - but not entirely - by changes in law school enrolments. Table 6 shows law school enrolment doubled between 1961 and 1967. Enrolment increases have been matched, with a three-year lag, by increases in the number of law school graduates, and the number called to the Bar follows very closely the number of graduates two years previous. Enrolments have increased very little since 1975; and similarly the number of graduates since 1977. These plateaux are noteworthy because they appear to represent a return to long-run equilibrium in the lawyers' market. Moreover, the proportion of the Law Society membership in private practice has declined from 93 per cent in 1972 to 71 per cent in 1983. This is due to an increasing demand for "in-house" lawyers in government and business and to lawyers finding self-employment in nonlegal fields.

Table 6

The Supply of Lawyers to Private Practice in Ontario:
Law School enrolments, graduates, called to the Bar, and net additions to practice, 1962 to 1983

Year[a]	Full-time[b] Undergraduate Enrolment		Degrees Awarded (LLB and Licence)		Called to the Bar		Annual Net Increase in Private Practice[d]		"Warranted" Annual Growth Rate[e]
	No.	Percent Increase	No.	Percent Increase	No.	Percent Increase	No.	Percent Increase	Percent Increase
1951-61								4.5	6.8
1961-71								4.0	11.3
1960	904	-							
61	913	1.0	305	-					
62	1002	9.7	260	-14.8	304	-			
63	1181	17.9	249	-4.2	245	-19.5			
64	1375	16.4	298	19.7	257	4.9			
65	1627	18.3	315	5.7	235	-8.6			
66	1714	5.3	400	27.0	282	20.0			
67	1882	9.8	469	17.3	286	1.4			
68	2101	11.6	520	10.9	348	21.7			
69	2414	14.9	517	-0.6	397	14.1			
70	2712	12.3	600	16.1	444	11.8			
71	2914	7.4	726	21.0	455	2.5			
72	3166	8.6	777	7.0	498	9.5	485	7.3	10.5
73	3415	7.9	874	12.5	601	20.7	510	7.2	7.8
74	3549	3.9	934	6.9	713	18.6	582	7.7	2.7
75	3758	5.9	1067	14.2	839	17.7	547	6.7	-1.4
76	3796	1.0	1174	10.0	850	1.3	124	1.4	6.9
77	3727	-1.9	1255	6.9	945	11.2	154	1.7	3.2
78	3730	0.1	1232	-1.8	1008	6.7	399	4.4	2.9
79	3809	2.1	1203	-2.4	1073	6.4	616	6.6	3.3
80	3964	4.1	1219	1.3	1077	0.4	464	4.6	0.8
81	4039	1.0	1310	7.5	1053	-2.2	320	3.1	4.5
82	4050	0.3	1342	2.4	1044	-0.9	371	3.4	-7.0
83	-				1000	-4.3	303	2.7	4.5

a Beginning of academic year for enrolments, and calendar year for degrees and Call.

b Part-time enrolments are a very small percentage of the total.

c Preliminary data.

d As at June 30 of each year; based on Census data to 1971 and Law Society data thereafter.

e Real economic growth rate multiplied by 1.5.

Source: Statistics Canada, Universities: Enrolment and Degrees, No. 81-204; and Law Society of Upper Canada.

The demand for lawyers' services is determined by general factors such as the level of national income, as well as by certain specific factors such as real estate transactions, separations and divorces, wills and estate settlements, bankruptcies, security issues, patents and trademarks, collective agreements, criminal charges and insurance claims. An American study examining the demand for legal services found that "the economic status of the legal profession is closely tied to the performance of the economy". The same study found the demand for legal services to be quite responsive to changes in national income; for each percentage point increase in real Gross National Product there was approximately a two per cent increase in expenditures for legal services.[14]

Canadian experience with the lawyers' labour market has been similar to the American case. There, the legal profession had two extended periods of high relative earnings: in the 1920s and in the late 1960s/early 1970s. These peaks were due to strong growth in the demand for legal services following rapid growth in real national income, with slow supply adjustment. This slow adjustment to the sharp increase in demand for lawyers in the 1950s and 1960s also occurred in Canada, particularly in Ontario where Osgoode Hall was the sole law school until 1957. When responsibility for legal education passed to the universities, the size and number of law schools increased quickly. The delayed adjustment to the greater demand for lawyers, resulting in rising relative earnings, continued through to the later 1970s when enrolments, graduates, and Calls to the Bar reached the plateaux noted earlier in this section.

"Are there too many lawyers?" One approach is to compare rates of change in supply and demand by comparing the growth rate of lawyers in private practice with the real economic growth rate.

It would appear that the stock of lawyers grew too slowly in the 1950s, and especially in the 1960s. For most of the 1970s, however, supply increased more quickly than demand. These differential growth rates by decade are quite consistent with the data on relative incomes for self-employed lawyers' services: there was a slight overall increase in their relative incomes in the 1950s, a strong rise in the 1960s, and then a decline in the 1970s. (See Figure 2.)

In the next decade the most likely outcome will be that supply increases less quickly than demand. The number of lawyers is likely to increase more slowly than in the 1970s and may even remain constant or decline slightly by the end of the 1980s. Law schools are operating at full capacity. There is no reason to expect the ratio of law degrees to enrolments to increase; nor is there likely to be any increase in the ratio of law graduates (LLB) to numbers called to the Bar. Any increase in alternative employment for law graduates who did not seek a call to the Bar would have a downward influence on lawyer supply. The number of lawyers in private practice in Ontario will therefore very soon reach a plateau, and may even decline slightly as more lawyers find employment in governments and corporations. This latter effect seems plausible given the current declining proportion of lawyers in private practice. When one extrapolates from the recent slower growth, it would appear that the maximum rate of increase will be about 3 per cent and could be much closer to zero.

Now consider the demand for lawyers' services. This is much more difficult to forecast. The demand for services of lawyers in private practice will depend primarily on real economic growth, and to a lesser extent on changes such as may affect Legal Aid, interpretations of civil rights, etc. On the assumption that real growth will average about 2 per cent annually over this decade,

the demand for legal services should increase by at least 3 per cent and possibly 4 per cent annually. Compare this conservative estimate of growth in demand with a "high-side" estimated increase in supply of 3 per cent annually. The more likely case would feature economic growth at 3 per cent annually, demand for lawyers increasing at 4 to 6 per cent, and lawyer supply increasing at perhaps 1 or 2 per cent. It seems most improbable therefore that there will be a surplus of lawyers in the next decade. Any quota on law school enrolments or admission to the Bar would therefore be inappropriate.

While the total Ontario labour market for lawyers appears to be in balance once more, there is little information by which to assess the regional or local situations. One could, however, make inter-regional comparisons of socio-economic data such as divorce rates, real estate transactions, real income, proportion of labour force in the service sector, criminal charges and civil suits, and then compare these data with the regional distribution of lawyers in private practice. Although such comparisons would not indicate a "correct" number of lawyers for each region or municipality, they could suggest centres of stronger or weaker demand for lawyer services and thus offer guidance to young lawyers seeking a favourable location.

Concluding Observations

Any assessment of government's role in regulating or accommodating variations in university enrolments needs to make at least two basic distinctions. First, the question of appropriate enrolment levels should not be confused with whether there should be more or less public financing for these programs. There could be a situation in which enrolments should increase but the public share of the total instructional cost should be reduced, and vice versa. Second, there should be a distinction between government's role in the secular or long-run changes in the size, location, and quality of professional programs

and government's more limited place in the cyclical enrolment variations due largely to cyclical economic conditions. It is particularly important that short-run enrolment shifts should not be exacerbated by government or other institutional reactions because the professional occupations are intrinsically long-run in nature: they require a long training period, and graduates are usually practising their profession steadily for 30 to 50 years. Unfortunately, there is no general definition of short- or long-run, and no clear boundary to mark their division. Experience with the "cobweb" cycles in some professional occupations does indicate however that these are of about four to six years in duration. In this sense the long run can be interpreted as what happens in the next decade and beyond.

How should universities respond to public pressure or other signals to alter the level of enrolment in particular programs? It should be evident that neither a laissez-faire nor a pure planning approach is appropriate. The former would have the universities fully accommodate changes in students' preferences, with at least initially a lower quality of all programs as staff and other resources were reallocated to meet the new needs. A strict adherence to the planning approach could similarly result in counter-productive shifts, especially if grants or fees were not increased to support the transitional costs.

Instead, the universities need to monitor continuously the trends in labour market conditions for occupations that are filled mainly by university graduates, and then make gradual shifts in instructional resources to accommodate the long run trends. This approach emphasizes the universities' unique ability to collect and disseminate information that will influence student choices. It also emphasizes the view that individual students are the most effective decision-makers on occupational choices provided that they have sufficient information and the proper incentives to take account of public priorities.

Notes

1. Canadian Association of University Teachers. "Response to Labour Market Development in the 1980s", Ottawa: CAUT, January 22, 1982, p. 1

2. See for example, The Struggle for Canadian Universities by Robin Mathews and James Steele, 1969.

3. Richard B. Freeman, "Legal 'cobwebs': a recursive model of the market for new lawyers", Review of Economics and Statistics, 1975, 57(2); and Peter Pashigian, "The market for lawyers: The determinants of the demand for and supply of lawyers", Journal of Law and Economics, 1977, XX(1).

4. B. Ahamad and M. Blaug, p. 307.

5. J.K. Folger, H.S. Astin, and A.E. Bayer, p. 42.

6. R.B. Freeman (1971), p. 192.

7. Robt. Lindley, p. 169.

8. Carnegie Commission on Higher Education, p. 164.

9. R.B. Freeman (1971), p. 183.

10. David Dodge and Neil Swan, p. 21.

11. Maurice Peston, pp. 125, 137.

12. Summarized and updated from David Stager, 1983b.

13. See, for example, Toronto Globe and Mail, June 2, 1984, "Cut number of new lawyers, legal group urges".

14. P. Pashigian, loc. cit., p. 81.

Table A1

Bachelor and First Professional Degrees Granted by Ontario Universities, Selected Fields of Study, 1960 to 1982

Year	Education	Business, Commerce	Law	Architecture	Engineering	Dentistry	Medicine	Total[a]
1960	288	251	463	31	681	95	297	5974
1961	361	285	305	23	734	72	297	6247
1962	339	272	260	37	770	85	312	6914
1963	390	289	249	24	755	126	303	7648
1964	450	324	298	25	893	123	276	8854
1965	523	347	315	32	802	120	288	9938
1966	518	356	400	30	900	122	320	10935
1967	524	417	469	34	958	126	298	12869
1968	524	413	520	47	1066	128	345	15107
1969	521	418	517	39	1210	130	369	17515
1970	1367	655	600	43	1557	136	377	20946
1971	3014	614	726	38	1644	143	389	24648
1972	2525	809	777	56	1691	158	422	28047
1973	2833	982	874	84	1757	160	476	29717
1984	2840	1047	934	166	1802	182	538	31686
1975	6629	1781	1067	234	1857	164	596	36513
1976	8173	1942	1174	158	1851	178	657	38911
1977	7821	2165	1255	240	1999	177	636	40278
1978	6782	2258	1232	263	2209	184	643	39714
1979	5574	2216	1203	251	2409	175	662	37741
1980	4845	2604	1219	191	2644	191	629	36233
1981	5115	2992	1310	200	2667	181	662	36159
1982	5326	3399	1342	208	2716	188	634	37208

[a] This is the total of all bachelor and first professional degrees, including degrees in Arts and Science.

Source: Statistics Canada, Degrees, Diplomas, Certificates Awarded by Degree-granting Institutions (81-211), annual.

REFERENCES

Ahamad, B. and Mark Blaug. The Practice of Manpower Forecasting, Amsterdam: Elsevier, 1973.

Arrow, K.J. and W.M. Capron. Dynamic shortages and price rises: the engineer-scientist case, Quarterly Journal of Economics, 1959, 73 (2), 292-309.

Association of Universities and Colleges of Canada. Response to the Task Force on Labour Market Development in the 1980s. Ottawa: AUCC, 1981.

Blank, D.S. and G.J. Stigler. The Demand and Supply of Scientific Personnel. New York: National Bureau of Economic Research, 1957.

Blaug, M. Approaches to educational planning. Economic Journal, 1967, 77 (June), 262-287.

Bombach, G. Manpower forecasting and educational policy. Sociology of Education. 1965, 38(5), 343-374.

Bowman, M.J. Educational shortage and excess. Canadian Journal of Economics and Political Science, 1963, 29(4), 446-461.

Buckley, Helen and Soren, T. Nielsen. Immigration and the Canadian Labour Market. Ottawa: Manpower and Immigration, 1976.

Canada. Employment and Immigration Canada. Labour Market Development in the 1980s. Ottawa: Supply and Services Canada, 1981.

_____. The Canadian Occupational Projection System (COPS), Systems Information. Ottawa, 1983.

Canada. Parliament, House of Commons. Work for Tomorrow: Employment Opportunities for the '80s. (Allmand Report) Montreal: b.é.d. concept & communication Ltd., 1981.

Carnegie Commission on Higher Education. College Graduates and Jobs. New York: McGraw-Hill, 1973.

Clark, W. and Z. Zsigmond. Job Market Reality for Post-Secondary Graduates no. 81-512. Ottawa: Statistics Canada, 1981.

Colvin, J.A. Higher education and manpower needs. Canadian Journal of Higher Education. 1979, 9(2), 87-94.

Davies, James B. and Glenn M. MacDonald. Information in the Labour Market, (Ontario Economic Council Research Study, 29) Toronto: University of Toronto Press, 1984.

Davis, J.R. and J.F. Morrell. Evaluating Educational Investment. Lexington, Mass.: Lexington Books, 1974.

Devine, Eugene J. Analysis of Manpower Shortages in Local Government: Case Studies of Nurses, Policemen, and Teachers. New York: Praeger, 1970.

Dodge, David and Neil Swan. Factors Influencing Career Choices of Students. Kingston: Queen's University Institute for Economic Research, 1971.

Economic Council of Canada. In Short Supply: Jobs and Skills in the 1980s. Ottawa: Supply and Services Canada, 1982.

Folger, John K., Helen S. Astin and Alan E. Bayer. Human Resources and Higher Education. New York: Russell Sage Foundation, 1970.

Foot, David K. Labour Market Analysis with Canadian Econometric Models: A Review. Toronto: Centre for Industrial Relations, University of Toronto, 1980.

Freeman, Richard B. The Market for College-Trained Manpower. Cambridge, Mass.: Harvard University Press, 1971.

_____. Legal "cobwebs": a recursive model of the market for new lawyers. Review of Economics and Statistics. 1975, 57(2), 171-179.

_____. The Over-Educated American. New York: Academic Press, 1976.

_____. An empirical analysis of fixed coefficient manpower requirement models, 1969-70. Journal of Human Resources. 1980, XV(20), 196-199.

Fulton, O., A. Gordon and G. Williams. Higher Education and Manpower Planning. Geneva: International Labour Office, 1982.

Gordon, M.S. (ed.) Higher Education and the Labor Market. New York: McGraw Hill, 1974.

Harvey, E.B. and K.S.R. Murthy. Supply of and Demand for New Graduates in Engineering, Chemistry, Business and Commerce. Toronto: Technical Service Council, 1975.

Holland, John W. and Michael L. Skolnik. Public Policy and Manpower Development. Toronto: Ontario Institute for Studies in Education, 1975.

Leslie, Peter M. Canadian Universities: 1980 and Beyond. Policy study no. 3. Ottawa: Association of Universities and Colleges of Canada, 1980.

Lester, Richard A. Manpower Planning in a Free Society. Princeton, N.J.: Princeton University Press, 1966

Lewis, D.W. Research Into Dental Manpower in Ontario. Research report. no. 43. Toronto: University of Toronto Faculty of Dentistry, 1981.

Lindley, Robt. (ed.) Higher Education and the Labour Market. Guildford, Surrey: Society for Research into Higher Education, 1981.

Mehmet, Ozay. Economic returns on human capital formation in Canadian university education, 1961 to 1972. Relations Industrielles/Industrial Relations. 1977, 32(2), 321-339.

Meltz, Noah M. Identifying sources of imbalance in individual labour markets. Industrial Relations/Relations Industrielles. 1976, 31(2), 224-246.

_____. Economic Analysis of Labour Shortages: The Case of Tool and Die Makers in Ontario. Toronto: Ontario Economic Council, 1982.

_____. Labour market information in Canada: The current situation and a proposal. Relations Industrialles/Industrial Relations, 1982, 37(2), 431-437.

_____ and John H. Blakely. Linking Firms' and Macro Human Resource Planning. Toronto: Ontario Manpower Commission, 1984.

_____ and David Stager. The Occupational Structure of Earnings in Canada, 1931-1975. Ottawa: Supply and Services Canada, 1979.

Moore, L.F. and L. Charod (eds.). Manpower Planning for Canadians: an Anthology. Vancouver: Institute for Industrial Relations, University of British Columbia, 1979.

Ontario. Employment survey of 1979 graduates of Ontario universities. Toronto: Ministry of Colleges and Universities, 1980.

_____. Report of the Committee on the Future Role of Universities in Ontario. Toronto: Ministry of Colleges and Universities, 1981.

Ontario Council of Health. Medical Manpower for Ontario. Toronto: Queen's Printer, 1983.

Peston, Maurice, Higher Education Policy, in Robt. Lindley (ed.) Higher Education and the Labour Market. Guildford, Surrey: Society for Research into Higher Education, 1981, 120-147.

Picot, W.G. University Graduates and Jobs: Changes During the 1970s. (No. 89-501E) Ottawa: Statistics Canada, 1982.

_____. The use of "fixed coefficient" matrices to relate occupation and field of study in manpower requirement models. Research paper no. 2 Research and Analysis Division. Ottawa: Statistics Canada, 1982.

Psacharopoulos, George. Returns to education: an updated international comparison, Comparative Education Review, 1981, 17 (June), 321-341.

Selleck, Laura. Manpower Planning and Higher Education Policy. Toronto: Council of Ontario Universities, 1982.

_____. Jobs for university graduates: planning or choice? Canadian Public Policy. 1983, 9(1), 94-104.

Siddiqui, Farid, Ray Vafa, C.Y. Hsu, and Brinda Murti. Labour Market Outlook for Ontario, 1981-1986. Toronto: Ontario Manpower Commission, 1981.

Skolnick, Michael L. The university and manpower planning. Canadian Journal of Higher Education. 1983, XIII(3), 77-95.

Solmon, Lewis C. and Paul J. Taubman (eds.) Does College Matter? New York: Academic Press, 1973.

Stager, David. Elementary and Secondary School Teachers Salaries in Ontario, 1900 to 1975. Toronto: Commission on Declining Enrolments in Ontario, 1978.

_____. Manpower issues in the financing of Canadian universities, in David M. Nowlan and Richard Bellaire (eds.) Financing Canadian Universities: For Whom and By Whom? Toronto: OISE Press, 1981.

_____. Federal Involvement in Post-Secondary Education for Highly Qualified Labour, Labour Market Development Task Force Technical Studies Series. Ottawa: Supply and Services Canada, 1981.

_____. Dynamic information for entrants to the highly qualified labour market. Canadian Journal of Higher Education. 1983, XIII(1), 65-74.

_____. Are there too many lawyers? Canadian Public Policy. 1983, IX(2), 245-249.

_____ and Noah M. Meltz. Manpower planning in the professions. Canadian Journal of Higher Education. 1977, VII(3), 73-83.

United States. Bureau of Labor Statistics. Occupational Outlook Handbook. Washington, D.C.: U.S. Government Printing Office, annual.